

REMARKS

Initially, Applicants would like to thank the Examiner for the finding of allowable subject matter in Claims 35-38. Claims 1-69 are pending in the present application. Claims 7-13, 39, 47, 48, 50, 52, 54, 56, 58-67 and 69 are withdrawn from further consideration. Claims 1-6, 14-38, 40-46, 49, 51, 53, 55, 57 and 68 are under examination. Claim 23 is cancelled. Claims 1, 15, 55 and 68 are amended herein for clarity and to more particularly define the invention. Support for the amendments to claims 1 and 68 can be found in the specification on page 8, lines 3-13, in the claims as filed, and elsewhere throughout the specification. Claims 15 and 55 are amended herein as suggested by the Examiner. No new matter is believed to be added by these claims. Therefore, in light of the following remarks, applicants respectfully request reconsideration of this application and allowance of the pending claims to issue.

Applicants gratefully acknowledge the courtesy of a telephonic interview between Examiner Berman and Applicants' representatives, Brian Meadows and Lizette Fernandez, on July 3, 2006. During this interview, the rejection of claims 1 and 68 under 35 U.S.C. § 112 was discussed. The rejection of claims 1-3, 5, 15-17, 24-26, 40-44, 46, 51, 53, 55, 57 and 68 as allegedly being obvious and unpatentable in view of U.S. Patent No. 6,096,795 (Abusleme) was also discussed. The claims set forth herein and the following remarks more specifically address the issues discussed during the interview.

I. REJECTIONS UNDER 35 U.S.C. § 112

The Office Action states that claims 1-6, 14-46, 49, 51, 53, 55, 57 and 68 are rejected as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Office alleges that in claim 1, lines 6-8 and in claims 68, lines 5-7, it is not clear from the phrase "one kind of monomer-soluble radical active centers" whether the initiator system produces plural "radical active centers" containing "desired end group functionalities" or the initiator system produces one kind of radical active center containing the desired end group functionality.

In response, Applicants respectfully point out that the specification describes water-soluble photo-initiator systems as systems that yield one kind of monomer soluble radical active centers. These radical active centers enter the monomer droplets and initiate polymerization (see, for example, page 8, lines 3-13). Therefore, it is clear that the water soluble photo-initiator system yields plural or multiple radical active centers of the same kind, containing the desired end group functionalities. Thus, Applicants believe that the language of claims 1 and 68 is clear when specifying that “radical active centers” (plural) and not “a radical active center” (singular) are produced by the photo-initiator system.

The Office Action further alleges that with respect to claims 1 and 68, it is not clear what substances are present in the initiator system to produce end groups such as the hydroxyl, isocyanate, cyanide, nitro, nitrile or amine groups set forth in claim 23.

Claims 1 and 68 are amended herein to incorporate the limitations of originally filed claim 23. As stated above, the specification describes water-soluble photo-initiator system as systems that will yield monomer soluble radical active centers. Because these radical active centers initiate polymerization, they form a bond with the monomer and become an end group of the resulting polymer chain. Accordingly, the functionality of the polymer end group is determined by the chemical structure of the initiating radical. Therefore, one of skill in the art would clearly know how to select a photo-initiator that produces an end group selected from the group consisting of a hydroxyl, an isocyanate, a cyanide, a nitro, a nitrile or an amine group, as claimed herein. Moreover, the specification at page 19, line 18, to page 24, line 12, describes various exemplary water-soluble photo-initiator systems and ways to select those that will provide a given monomer soluble radical active center, and thus a polymer end group selected from the group consisting of a hydroxyl, an isocyanate, a cyanide, a nitro, a nitrile or an amine group.

Further stated in the Office Action is that in claim 15 it is allegedly not clear what is meant by the phrase “monomer is chosen for its preferred mode of termination.” Applicants believe that the specification clearly sets forth at page 14, line 3 to page 15, line 13, that the selection of a monomer for its preferred mode of termination includes the selection of a monomer that will produce a polymer having the desired functionality at one end or,

alternatively both ends, of the polymer chain. However, in order to further prosecution, as suggested by the Examiner, claim 15 is amended herein to recite “[t]he method of claim 1 wherein the monomer is chosen for its preferred mode of termination of the polymer chain by combination or disproportionation.

The Office Action also alleges that in claim 55 it is not clear whether the “end group of specified functionality” are provided by the monomer structure or by the initiator system as set forth in claim 1.

Applicants agree with the Examiner that the end group of specified functionality is provided by the initiator system in claim 1. Therefore, since claim 55 is dependent from claim 1, it is clear that the end groups of specified functionality must come from the initiator system. However, in order to advance prosecution, as suggested by the Examiner, claim 55 is amended herein to recite, in relevant part, “wherein the selection of monomer determines whether each chain contains one or two end groups of specified functionality derived from the initiator system.”

II. REJECTIONS UNDER 35 U.S.C. § 102(b)

A. Capek et al.

The Office has rejected Claims 1, 3-6, 14-17, 19, 21, 24-26, 30-34, 40-46, 51, 53, 55, 57 and 68 for allegedly lacking novelty in view of the teachings of Capek *et al.*, in the article “Kinetics of Photopolymerization of Butyl Acrylate in Direct Micelles.” Specifically, Capek *et al.* is directed to formation of polybutylacrylate from the polymerization of butyl acrylate monomer. The Office Action contends that Capek *et al.* discloses a process of forming a microemulsion of butyl acrylate, surfactant and water and polymerization initiated in the presence of a photoinitiator, such as 2,2-dimethoxy-2-phenylacetphenone, by monochromatic UV light. Further stated in the Office Action is that butyl acrylate forms an excited state upon irradiation and that the photoinitiator generates radicals, thus affecting molecular weight of the polymer. Therefore, the Office Action concludes that the process of photoinitiated radical formation disclosed by Capek *et al.* would be expected to provide a poly(butylacrylate) having

butyl groups as desired end groups.

Applicants reiterate that the disclosure of Capek et al. is directed to conventional chain polymerization process in which one monomer attaches to a subsequent monomer thus forming a chain polymer. To that end, irrespective of whether or not the butyl end group of Capek et al. can be considered a desired functional end group, the butyl group of Capek et al., as acknowledged by the Examiner, is provided by the butyl acrylate monomer. In contrast, independent claims 1 and 68 recite, in part, a process whereby an initiator system produces one kind of monomer-soluble radical active centers and wherein the radical active centers contain the desired end group functionalities for a polymer or oligomer. Thus, the desired functional end group of Applicants claims is provided by the initiator system not the monomer. In fact, the Examiner has admitted, in the paragraph bridging pages 4 and 5 of the Office Action, that the end groups of specified functionality are provided by the initiator system as set forth in claim 1. The disclosure of Capek et al. fails to teach or suggest a process whereby an initiator system produces monomer-soluble radical active centers and wherein the radical active centers contain the desired end group. Accordingly, for at least this reason, Capek et al. fails to teach each and every feature of Applicants' claims. Therefore, Applicants believe this rejection should be withdrawn as it applies to claims 1, 3-6, 14-17, 19, 21, 24-26, 30-34, 40-46, 51, 53, 55, 57 and 68.

III. REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 1 and 68, and certain claims depending therefrom, have been rejected under 35 U.S.C. § 103(a) for allegedly being obvious an unpatentable on a number of grounds.

To that end, it is well settled in law that a *prima facie* case of obviousness requires that the art of record must teach or suggest the claimed invention as a whole and there must also be the requisite motivation to undertake the combination or modification proposed in the rejection. As set forth below, the current obviousness rejections under section 103(a) fail to satisfy these requirements and therefore must be withdrawn.

A. Capek et al. in view of Capek et al.

The Office Action states that claims 2, 20, 22, 23, 27 and 28 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Capek et al. in the article “Kinetics of Photopolymerization of Butyl Acrylate in Direct Micelles” (herein after “Capek I”) as applied to 1-6, 14-17, 19, 21, 24-26, 30-34, 40-44, 46, 51, 53, 55, 57 and 68 above, and in further view of Capek, in the article “Photopolymerization of Butyl Acrylate Microemulsion” (herein after “Capek II”).

Applicants have addressed the disclosure of Capek I above. Similar to the disclosure of Capek I, Capek II describes the photopolymerization of butyl acrylate which results in poly(butylacrylate) having butyl groups as end groups. Irrespective of whether or not the butyl group of Capek II can be considered a desired functional end group, the butyl group of Capek II is provided by the butyl acrylate monomer and not from an initiator system. In contrast, and as discussed above, claim 1, from which claims 2, 20, 22, 23, 27 and 28 depend, recites, in part, a process whereby an initiator system produces one kind of monomer-soluble radical active centers and wherein the radical active centers contain the desired end group functionalities for a polymer or oligomer. Thus, the desired functional end group of Applicants claims is provided by the initiator system not the monomer. Thus, for at least this reason, both Capek I and Capek II fail to teach or suggest the claimed invention as a whole.

The Office Action alleges that Capek II teaches photoinitiated hydrogen abstraction from the emulsifier and teaches adding butanol as co-emulsifier and, therefore, discloses a process which could have been expected to provide hydroxyl end groups for the polymer derived from the interaction of hydrogen abstracting component and emulsifier. The Office further states that it would have been obvious to one skilled in the art at the time of the invention to employ a co-emulsifier, such as butanol, in the microemulsions containing a water soluble photoinitiator taught by Capek I, as taught by Capek II, in an analogous method of photopolymerization in microemulsion. According to the Office Action, one of ordinary skill in the art at the time of the invention would have been motivated by an expectation of providing hydroxyl end groups for the polymer derived from the emulsifier/co-emulsifier, as taught by Capek II. The Office Action

further alleges that it would have been obvious to one skilled in the art at the time of the invention to include a hydrogen abstracting photoinitiator as taught by Capek II in the method for polymerization disclosed in Capek I. The Office concludes that one of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of taking advantage of the hydrogen abstracting property of the initiator to interact with a co-emulsifier to provide hydroxyl end groups as taught in Capek II.

Applicants respectfully point out that neither Capek I or Capek II discloses or suggests that the polybutylacrylate formed by photopolymerization can have any end groups other than the butyl end groups provided by the butyl acrylate monomer. To allege that one of skill in the art would be motivated to provide non-butyl end groups by taking advantage of the hydrogen abstracting property of the initiator to interact with a co-emulsifier to provide hydroxyl end groups is simply hindsight reconstruction. In fact, to state that the process described in Capek II can be expected to provide hydroxyl groups for the polymer derived from the interaction of hydrogen abstracting component and emulsifier is speculation about how these hydroxyl groups may interact with a polymer. It is improper for the Examiner to utilize the teachings of the present invention to interpret Capek I and Capek II as disclosures which provide polybutyl acrylate polymers with end groups other than the end groups provided by butyl acrylate monomers. To this end, applicants remind the Examiner that it is not enough to combine references without some objective reason to do so. To combine prior art references without evidence of such suggestion, teaching or motivation is an impermissible hindsight reconstruction and simply takes the inventor's disclosure as a blueprint for piecing together the prior art in an effort to defeat patentability. *See In re Dembiczak*, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). Simply put, the motivation to combine references can not come from the invention itself. *See In re Oetiker*, 977 F.2d 1443, 1447, 24 USPQ2d 1443, 1446 (Fed. Cir. 1992). Neither Capek I or Capek II appreciated the advantages of providing desired end groups that are produced by a water-soluble photoinitiator system. It is the present invention not the prior art, that appreciates these advantages. Therefore, based on the teachings of Capek I and Capek II, one of skill in the art would not have been motivated to combine Capek I and Capek II to arrive at the claimed invention.

B. Capek et al. in view of Capek et al. and further in view of Dietz et al.

The Office Action states that claims 18 and 29 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Capek I, in view of Capek II, as applied to 1-6, 14-17, 19-28, 30-34, 40-44, 46, 51, 53, 55, 56 and 68 above, and further in view of Dietz et al. However, as set forth below, the disclosure of Capek I in view of Capek II and further in view of Dietz et al. fail to teach or suggest Applicants claimed invention as a whole and similarly lack the requisite motivation required to make the alleged combination thereof.

According to the Office Action, neither Capek I or Capek II mentions selecting surfactant and co-surfactant based on the hydrophile-lipophile balance or ketone photoinitiators having hydroxyl groups. Further stated in the Office Action is that Dietz et al. teaches surfactants and co-surfactants, providing HLB and using hydroxyl-phenyl ketones in analogous microemulsion photopolymerizations.

Applicants respectfully remind the Examiner that claims 18 and 29 depend from claim 1, which is directed to a single phase microemulsion system. Capek I and Capek II are discussed above. Dietz et al. is directed to the formation of polymerized bi-continuous phase microemulsion thus resulting in the formation of a bi-continuous phase polymer having structural integrity throughout both continuous phases. Significantly, Dietz teaches that neither phase is a dispersed phase and, as such, neither phase is separable from the other phase. *See* Col. 4, lines 20-26. It is further apparent from the teaching of Dietz that his bi-continuous phase microemulsion is critical to achieving the various advantages sought therein. For example, the bi-continuous phase microemulsion can provide a resulting product having a continuous phase of pressure sensitive adhesive properties and a continuous phase of hydrophilic polymer properties. Accordingly, for at least this reason, Dietz not only fails to teach or suggest the formation of a single phase microemulsion but actually teaches away from a single phase microemulsion altogether. Therefore, the photopolymerizations of Dietz et al. are not analogous to those of Capek I and Capek II. In fact, the Office points to nothing in Dietz et al. that suggests that hydroxyl phenyl ketones can be utilized in anything other than a bi-continuous phase

microemulsion. Similarly, although Dietz et al. teach that it is desirable to have a balance between hydrophobic and hydrophilic elements in the surfactants, there is nothing in Dietz et al. that would indicate that this is applicable to a single phase microemulsion. Accordingly, in the absence of such precise identification of a suggestion, teaching or motivation in these prior art references, the Office has necessarily presented a rejection based solely on improper hindsight reconstruction. Furthermore, even assuming *arguendo* that one of skill in the art would seek to combine Dietz et al., with Capek I and Capek II, based on the deficiencies of Capek I and Capek II discussed above, it is evident that the resulting combination of Capek I, Capek II and Dietz et al. would fail to arrive at the presently claimed invention. Therefore, it is respectfully submitted that the Office has failed to present a *prima facie* case of obviousness and, as such, the current rejection of claims 18 and 29 must be withdrawn.

C. Kuo et al. in view of Morgan et al.

The Office has rejected Claims 1-4, 15-17, 19-28, 30, 40-44, 46, 49, 53, 55, 57 and 68 as allegedly being obvious and unpatentable over the teachings of Kuo et al. from the article "Photoinitiated Polymerization of Styrene in Microemulsions" (hereinafter "Kuo") in view of Morgan et al. in the article "Kinetics and Mechanism of Microemulsion Polymerization of Hexyl Methacrylate" (hereinafter "Morgan").

As amended, Claims 1 and 68 of the instant application recite, in part, forming a single phase monomer in water microemulsion comprising monomer, water, and an effective amount of an effective surfactant. A water soluble photo-initiator system is added to the microemulsion wherein the initiator system produces one kind of monomer-soluble radical active centers and wherein the radical active centers contain the desired end group functionalities for a polymer or oligomer. In contrast to the claimed invention, neither Kuo nor Morgan, alone or in combination, teach or even suggest a polymerization process that comprises a water soluble photo-initiator system.

The disclosure of Kuo reports on the photo-initiated polymerization of styrene in oil/water microemulsions using dibenzyl ketone (DBK) as the initiator. *See* Abstract. Significantly, dibenzyl ketone is not a water soluble photo-initiator. In fact, as acknowledged by Kuo, the study reported therein was based upon the use of an oil-soluble initiator, *i.e.*, the dibenzyl ketone, as the photoinitiator. *See* page 1220, col. 2, lines 48-49. Thus, for at least this reason, Kuo fails to teach or even suggest Applicants claimed invention as a whole.

The Office then goes on to make the unsupported allegation that it would have been obvious for one of skill in the art to seek additional guidance from the teachings of Morgan. More specifically, the Office suggests that it would have been obvious to one skilled in the art to add the water soluble initiator of Morgan to the monomer surfactant mixture taught by Kuo. However, irrespective of whether one of skill in the art would be motivated to combine the teachings of Kuo and Morgan, (which one would not), the resulting combination still fails to arrive at a polymerization process that comprises the use of a water soluble photo-initiator.

Specifically, Morgan reports on the kinetic analysis of the microemulsion polymerization of hexyl methacrylate. To this end, the polymerization discussed therein is a thermal polymerization reaction. Thus, the initiators described and used therein are not photo-initiators but rather initiators which chemically decompose to provide water soluble free radicals. Accordingly, while Morgan does discuss the use of water soluble initiators, there is no suggestion or motivation to utilize water soluble photo-initiators. Thus, for at least these reasons, it is evident that the alleged combination of Kuo in view of Morgan fails to provide a polymerization process that comprises a water soluble photo-initiator and therefore fails to teach or even suggest Applicants invention as a whole.

Moreover, notably absent from the Office's rejection is the precise identification of a suggestion, teaching or motivation that would lead one of ordinary skill in the art to make the alleged combination. It is not enough to combine references without some objective reason to do so. Rather, to combine prior art references without evidence of such suggestion, teaching or motivation is an impermissible hindsight reconstruction and simply takes the inventor's disclosure as a blueprint for piecing together the prior art in an effort to defeat patentability. *See*

In re Dembiczak, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). Simply put, the motivation to combine references can not come from the invention itself. See *In re Oetiker*, 977 F.2d 1443, 1447, 24 USPQ2d 1443, 1446 (Fed. Cir. 1992).

As stated above, the Office contends that one of skill in the art would seek guidance from Morgan in order to incorporate a water-soluble initiator into the process taught by Kuo. However, the Office points to nothing in Kuo that suggests his polymerization process could be modified to incorporate a water soluble initiator rather than the oil-soluble initiator described therein. Similarly, the Office points to nothing that suggests the thermal polymerization process of Morgan could be modified to comprise the use a photo-initiator such as that taught by Kuo. Accordingly, in the absence of such precise identification of a suggestion, teaching or motivation in these prior art references, the Office has necessarily presented a rejection based solely on improper hindsight reconstruction. Therefore, it is respectfully submitted that the Office has failed to present a *prima facie* case of obviousness and, as such, the current rejection of Claims 1, 68, and those claims depending therefrom must be withdrawn.

D. U.S. Patent No. 6,096,795

The Office has further rejected claims 1-3, 5, 15-17, 24-26, 40-44, 46, 51, 53, 55, 57 and 68 as allegedly being obvious and unpatentable in view of U.S. Patent No. 6,096,795 (hereinafter "Abusleme"). As stated above, a *prima facie* case of obviousness requires that the art of record must teach or suggest the claimed invention as a whole and there must also be the requisite motivation to undertake the combination or modification proposed in the rejection. Initially, the Office recognizes that Abusleme fails to teach or suggest Applicants claimed invention as a whole when it acknowledges that Abusleme at least fails to mention choosing an initiator system and an illumination scheme to produce a desired molecular weight for the resulting polymer. However, notwithstanding this deficiency, the Office then makes the unsupported allegation that it nonetheless would have been obvious to one skilled in the art at the time of the invention to select an illumination scheme that would provide a polymer having a desired molecular weight.

Notably absent from the Office's rejection is the precise identification of a suggestion, teaching or motivation in Abusleme that would lead one of ordinary skill in the art to make the alleged combination.

It is not enough to combine references without some objective reason to do so. Rather, to combine prior art references without evidence of such suggestion, teaching or motivation is an impermissible hindsight reconstruction and simply takes the inventor's disclosure as a blueprint for piecing together the prior art in an effort to defeat patentability. *See In re Dembiczak*, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). Simply put, the motivation to combine references can not come from the invention itself. *See In re Oetiker*, 977 F.2d 1443, 1447, 24 USPQ2d 1443, 1446 (Fed. Cir. 1992).

While Abusleme admittedly discloses that the source of radiation can be deactivated to stop the polymerization reaction in the event of polymerization runaway, there is no suggestion or motivation in Abusleme to select a photoinitiator system designed to produce one kind of monomer-soluble radical active centers or to select an illumination scheme, prior to illuminating the microemulsion according to the selected temporal and spatial illumination scheme to photoinitiate polymerization of the monomer and to provide the polymer or oligomer having the desired end group functionalities, as recited in claims 1 and 68, in order to arrive at a polymer having a particularly desired molecular weight. Furthermore, deactivation to stop a polymerization reaction is not equivalent to *a priori* selection or predetermination of a temporal and spatial illumination scheme. Accordingly, in the absence of such precise identification of a suggestion, teaching or motivation in this reference, the Office has necessarily presented a rejection based solely on improper hindsight reconstruction. Therefore, it is respectfully submitted that the Office has failed to present a *prima facie* case of obviousness and, as such, the current rejection of Claims 1, 68, and those claims depending therefrom, in view of Abusleme must be withdrawn.

CONCLUSION

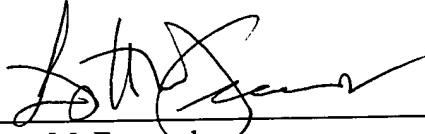
Pursuant to the above amendments and remarks, reconsideration and allowance of the pending application is believed to be warranted. The Examiner is invited and encouraged to

directly contact the undersigned if such contact may enhance the efficient prosecution of this application to issue.

A credit card payment authorization form authorizing payment in the amount of \$620.00 (\$395.00 RCE fee and \$225.00 Request for Extension of Time Fee), a Request for Continued Examination (RCE) Transmittal and a Request for Extension of Time are enclosed. No additional fee is believed to be due; however, the Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

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Lizette M. Fernandez

11/6/06

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